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Diagnoses of 24 New Species and Proposal of a New Name for a Species of Indo-Pacific Clupeoid Fishes

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Abstract Diagnoses are given for 13 new clupeid, 11 new engraulid species and a clupid with a new name from the Indo-Pacific region in order to make these names available to systematic workers pending publication of a complete revision of the Indo-Pacific clupeoid fauna. In addition, 4 new generic and 38 new specific allocations are listed.

Between late 1975 and early 1980 some fifteen thousand specimens of Indo-Pacific clupeoid fishes were studied at the British Museum (Natural History) in London, as well as nearly a thousand further specimens seen at or borrowed from other institutions. At least one of the available types of virtually all nominal species was examined. In addition to recording the standard morphometric and meristic characters, particular studies were also made of the upper and lower jaws, the circumorbital bones, the urohyal, the gill-rakers, parts of the visceral anatomy (digestive tract, swimbladder), the predorsal bones, the scales and scutes, and the caudal skeleton. The result was a two volume doctoral thesis submitted in January 1980 to the Faculty of Science, University of London, entitled "Systematics of clupeoid fishes of the Indo-Pacific region". In the course of this study I recognized 24 new clupeoid species and a clupeid which should be given a new name (and resurrected 38 junior synonyms), to make a total of 155 clupeoid species mainly from the tropical parts of this area.

Publication of the thesis will take time and in the meanwhile there are numerous taxonomists and field workers already using my keys and in some cases urgently needing to cite the new species. To prevent possible nomina nuda and to avoid citations to 'Species A' or 'Wongratana's new species', I hereby publish the new names with sufficient description and diagnosis to make them available. The most frequently cited species have been those designated by Ronquillo (1970) as *Stolephorus* A, B and C and repeated by Tiews et al. (1971), by Whitehead (1973) and in various fishery publications. They are identified here as:

Stolephorus Species A
=*Stolephorus devisi* (Whitley, 1940)
Stolephorus Species B
=*Stolephorus oligobranchus* sp. nov.
Stolephorus Species C
=*Stolephorus ronquilloi* sp. nov.

The last complete review of Indo-Pacific clupeoids was that by Fowler (1941). This was considerably updated by Whitehead (1973), who gave keys, synonymies, figures and literature for 27 genera and 68 species of the Indian Ocean. Whitehead's (1973) synopsis is still widely used by museum and fishery workers, as well as his clupeoid contribution to the FAO Species Identification Sheets for Areas 57 and 71, i.e. Southeast Asia (Fischer and Whitehead, 1974). To alert workers to nomenclatural changes pending full publication of my thesis, I give here those that will effectively update Whitehead's (1973) synopsis and the identification sheets of ten years ago.

The following generic changes are made:

Clupeidae

Amblygaster Bleeker, 1849 for three species hitherto included in *Sardinella* (*A. sirm, A. clupeoides, A. leiogaster*); recognized as a subgenus by Whitehead (1973)

Tenualosa Fowler, 1934 for five species hitherto included in *Hilsa* and one additional species (*T. toli, T. macrura, T. reevesii, T. ilisha, T. thibaudeaui*); recognized as a subgenus by Whitehead (1973)

Engraulidae

Thryssa Cuvier, 1829 to include also *Thryssa* (*Thrissina*) *baelama,* hitherto placed in *Thrissina* Jordan et Seale, 1925; all other

species placed in the subgenus *Thryssa* (*Scutengraulis*), except *Thryssa* (*Thryssa*) *setirostris*

Heterothrissa Günther, 1868 for a species hitherto included in *Setipinna* (*H. breviceps*).

In addition to the 24 new species and a species with a new name described here, I propose recognition of the following 38 junior synonyms and names that have been generally overlooked or misplaced:

Clupeidae

Dussumieria elopsoides Bleeker, 1849 (placed in synonymy of *D. acuta* by Whitehead, 1963, 1973)

Corica laciniata Fowler, 1935 (tentatively placed in synonymy of *C. soborna* by Whitehead, 1973)

Clupeichthys perakensis (Herre, 1936) (placed in synonymy of *Corica soborna* by Whitehead, 1973)

Clupeichthys bleekeri (Hardenberg, 1936) (placed in synonymy of *Corica soborna* by Whitehead, 1973)

Spratelloides robustus Ogilby, 1897 (as a subspecies of *S. delicatulus* in Whitehead, 1963, 1973)

Sardinella (*Sardinella*) *lemuru* Bleeker, 1853 (placed in synonymy of *S. aurita* by Whitehead et al., 1966)

Sardinella (*Clupeonia*) *jussieui* (Valenciennes, 1847) (confined to Mauritius; specimens hitherto identified as this fish have in fact been the widely distributed *S.* (*C.*) *gibbosa*)

Sardinella (*Clupeonia*) *fijiensis* (Fowler et Bean, 1923) (generally overlooked)

Sardinella (*Clupeonia*) *tawilis* (Herre, 1927) (generally overlooked)

Sardinella (*Clupeonia*) *hualensis* (Chu et Tsai, 1958) (generally overlooked)

Sardinella (*Clupeonia*) *atricauda* (Günther, 1868) (placed in synonymy of *S. melanura* by Whitehead, 1973)

Herklotsichthys quadrimaculatus (Rüppell, 1837) (placed in synonymy of *H. punctatus* by Whitehead, 1973)

Herklotsichthys spilura (Guichenot, 1863) (generally overlooked; described as *H. punctatus* Form A by Losse, 1968 and Whitehead, 1973)

Tenualosa thibaudeaui (Durand, 1940) (generally overlooked; given as *Hilsa kanagurta* by Taki, 1974)

Nematalosa chanpole (Hamilton-Buchanan, 1822) (placed in *Anodontostoma* by Whitehead, 1973 and regarded as doubtfully distinct from *A. chacunda*; described as *Nematalosa galatheae* by Nelson and Rothman, 1973)

Nematalosa papuensis (Munro, 1964) (placed in synonymy of *N. erebi* by Nelson and Rothman, 1973)

Anodontostoma selangkat (Bleeker, 1852) (placed in synonymy of *A. chacunda* by Whitehead, 1973)

Ilisha novacula (Valenciennes, 1847) (placed in synonymy of *Ilisha elongata* by Whitehead, 1973)

Ilisha filigera (Valenciennes, 1847) (placed in synonymy of *Ilisha megaloptera* by Whitehead, 1973)

Ilisha kampeni (Weber et de Beaufort, 1913) (largely overlooked)

Engraulidae

Stolephorus punctifer (Fowler, 1938) (largely overlooked; hitherto as *S. buccaneeri* Strasburg, 1960 in literature)

Stolephorus chinensis (Günther, 1880) (largely overlooked)

Stolephorus waitei Jordan et Seale, 1926 (largely overlooked; now includes *S. bataviensis* Hardenberg, 1933)

Stolephorus insularis Hardenberg, 1933 (placed in synonymy of *Stolephorus bataviensis* by Whitehead, 1973, but Hardenberg's material is mixed and his *Stolephorus insularis bataviensis* belongs in *S. waitei*; the name *Stolephorus insularum* Jordan et Seale, 1926 is not considered a senior primary homonym pace Fowler, 1941 and Whitehead, 1973)

Thryssa (*Scutengraulis*) *chefuensis* (Günther, 1874) (largely overlooked)

Thryssa (*Scutengraulis*) *scratchleyi* (Ramsay et Ogilby, 1886) (placed tentatively in synonymy of *T. malabarica* by Whitehead, 1973)

Thryssa (*Scutengraulis*) *aestuaria* (Ogilby, 1911) (largely overlooked; *T. brevicauda* Roberts, 1978 a synonym)

Thryssa (*Scutengraulis*) *adelae* (Rutter, 1897) (placed in synonymy of *T. dussumieri* by Whitehead, 1973)

Thryssa (*Scutengraulis*) *gautamiensis* Babu Rao, 1970 (placed tentatively in synonymy of *T. malabarica* by Whitehead, 1973)

Thryssa (*Scutengraulis*) *spinidens* (Jordan et Seale, 1925) (largely overlooked)

Setipinna tenuifilis Valenciennes, 1848 (placed in synonymy of *S. taty* by Whitehead, 1973; includes *S. godavari* Babu Rao, 1961; now separated into two subspecies, *S. tenuifilis tenuifilis* Valenciennes, 1848, of the Bay of Bengal to Sarawak, and *S. tenuifilis gilberti* of Jordan and Starks 1905, of the North China Sea)

Setipinna papuensis Munro, 1964 (placed in synonymy of *S. godavari* by Whitehead, 1973, which is *S. tenuifilis*)

Setipinna brevifilis (Valenciennes, 1848) (placed in synonymy of *Setipinna phasa* by Whitehead, 1973)

Coilia reynaldi Valenciennes, 1848 (includes *Coilia korua* Dutt et Seshagiri Rao, 1972, which was recognized as a valid species by Whitehead, 1973; a further synonym, *Coilia whiteheadi* Babu Rao, cited in synonymy of *C. korua* by Whitehead, does not seem to have been published, but 5 'paratypes' are clearly *C. reynaldi* (BMNH 1974.9.29.1 ~ 5))

Coilia borneensis Bleeker, 1851 (not in Whitehead, 1973, but recognized in Whitehead et al., 1966)

Coilia coomansi Hardenberg, 1934 (largely overlooked)

Coilia grayii Richardson, 1845 (placed in synonymy of *C. mystus* by Whitehead, 1973)

Coilia lindmanni Bleeker, 1858 (placed in synonymy of *C. mystus* by Whitehead, 1973).

My studies have shown the value of the various patterns of scale striae in clupeoid fishes as a systematic character. Since such patterns may vary according to the location of the scales, all descriptions given here refer to scales on the horizontal myoseptum and vertically above the anal fin origin, unless otherwise stated. Measurements follow the methods used by Whitehead and other authors; the last prepelvic scute is that which invests the pelvic base, the first postpelvic being that which lacks arms and lies between the pelvic fin bases.

Abbreviations

The material cited here is deposited in the following institutions: AMS: Australian Museum, Sydney; ANSP: Academy of Natural Sciences, Philadelphia; BMNH: British Museum (Natural History); CTNRC: Centre for Thai National Reference Collection, Bangkok; CUMZ: Chulalongkorn University Museum of Zoology, Bangkok; KUMF: Kasetsart University Museum of Fisheries, Bangkok; NIFI: National Insland Fisheries Institute, Dept. of Fisheries, Bangkok; RMNH: Rijksmuseum van Natuurlijke Historie, Leiden; RUSI: Rhodes University, J.L.B. Smith Institute of Ichthyology, Grahamstown; USNM: United States National Museum, Washington; UZMK: Universitets Zoologisk Museum, Copenhagen.

List of new species and a new name

Clupeidae

1. *Etrumeus whiteheadi*
2. *Clupeichthys aesarnensis*
3. *Spratelloides lewisi*
4. *Sardinella* (*Sardinella*) *neglecta*
5. *Sardinella* (*Clupeonia*) *richardsoni*
6. *Herklotsichthys gotoi*
7. *Herklotsichthys lossei*
8. *Escualosa elongata*
9. *Nematalosa flyensis*
10. *Gonialosa whiteheadi*
11. *Anodontostoma thailandiae*
12. *Pellona dayi*
13. *Ilisha striatula*
14. *Ilisha obfuscata*

Engraulidae

15. *Stolephorus oligobranchus*
16. *Stolephorus tysoni*
17. *Stolephorus ronquilloi*
18. *Stolephorus dubiosus*
19. *Stolephorus brachycephalus*
20. *Thryssa* (*Scutengraulis*) *kammalensoides*
21. *Thryssa* (*Scutengraulis*) *polybranchialis*
22. *Thryssa* (*Scutengraulis*) *whiteheadi*
23. *Thryssa* (*Scutengraulis*) *stenosoma*
24. *Thryssa* (*Scutengraulis*) *dayi*
25. *Setipinna wheeleri*

Description

Clupeidae

1. ***Etrumeus whiteheadi*** sp. nov.
(Fig. 1)

Holotype. 166.0 mm SL, Algoa Bay, Port Elizabeth, South Africa, coll. J. M. Leslie, BMNH 1890.6.27.24.

Paratypes. 3 fish, 39.5 ~ 46.0 mm SL, Knysna estuary, South Africa, coll. J. L. B.

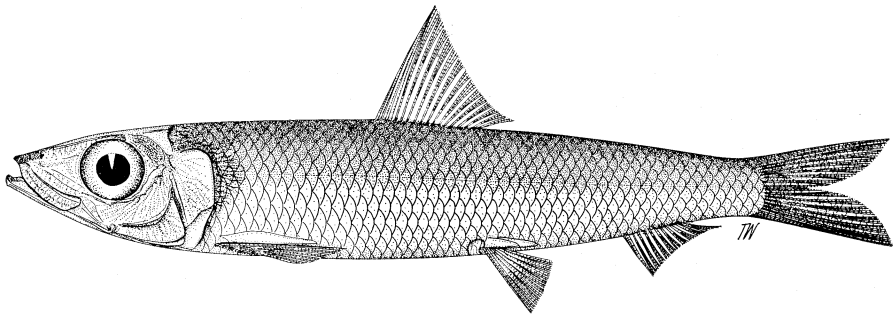

Fig. 1. *Etrumeus whiteheadi* sp. nov., holotype, 166.0 mm SL, Algoa Bay, Port Elizabeth, South Africa, BMNH 1890.6.27.24.

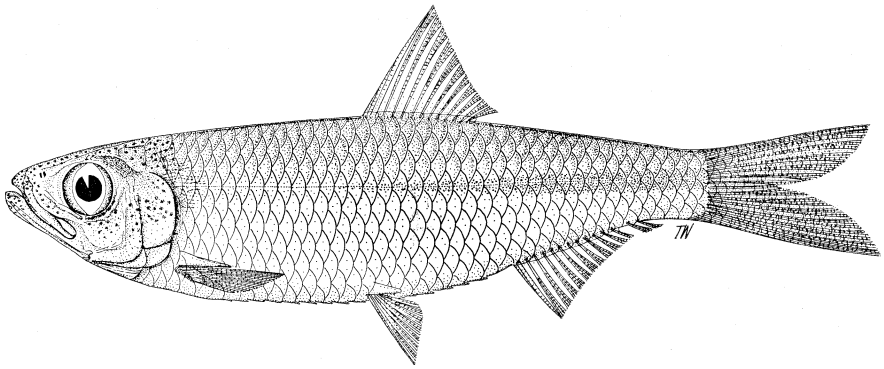

Fig. 2. *Clupeichthys aesarnensis* sp. nov., holotype, 43.5 mm SL, Ubonrat reservoir, Konkhan, Thailand, KUMF 2844a.

Smith, BMNH 1965.11.26.1～3; 2 fish, 43.0～45.0 mm SL, South Africa, coll. unknown, RUSI 3844-2; 2 fish, 143.0～153.0 mm SL, Walvis Bay, South Africa, coll. F.H. Schulein, RUSI 5706-2.

Other specimens: 71 fish, 22.0～61.0 mm SL, Saldana Bay, South Africa, coll. G. R. Robinson, all BMNH.

Diagnosis. Closely resembling *E. teres* (DeKay, 1842), hitherto regarded as the only *Etrumeus* species (Whitehead, 1963), but with more gillrakers in both halfgrown and adult fishes (16～18+36～39; cf. 12～15+30～35) and the pelvic fin base only just below or before the last dorsal finray (about 1/3 eye diameter behind in adult *E. teres*).

Other meristic counts are dorsal finrays 18～20, anal finrays 12～13, scales in lateral series 48～51, predorsal scales 15 and transverse scales 11 (cf. 19～22, 10～12, 52～58, 15～19 and 12～15 respectively in *E. teres*).

Etrumeus whiteheadi is recorded from Walvis Bay to Durban (where it is sympatric with the widespread *E. teres*). The 7-inch specimen figured by Smith (1961: fig. 106) agrees with *E. whiteheadi* in pelvic position. On the other hand, the two specimens from Cape Town described by Matsubara and Iwai (1959: 3, pl. 1 top–87.0 and 70.5 mm SL) agree with *E. teres* (dorsal finrays 18, anal finrays 11, gillrakers 14+32, scales in lateral series about 53, and pelvic fin base apparently somewhat behind last dorsal finray). Possibly the two species overlap as far as Cape Town.

Named for Dr. P. J. P. Whitehead, whose useful revision of *Etrumeus* (Whitehead, 1963) formed a basis for this study.

2. ***Clupeichthys aesarnensis*** sp. nov.
(Fig. 2)

Holotype. 43.5 mm SL, Ubonrat reservoir, Konkhan, Thailand, coll. by a student, KUMF 2844a.

Paratypes. 7 fish, 32.0～38.5 mm SL, as

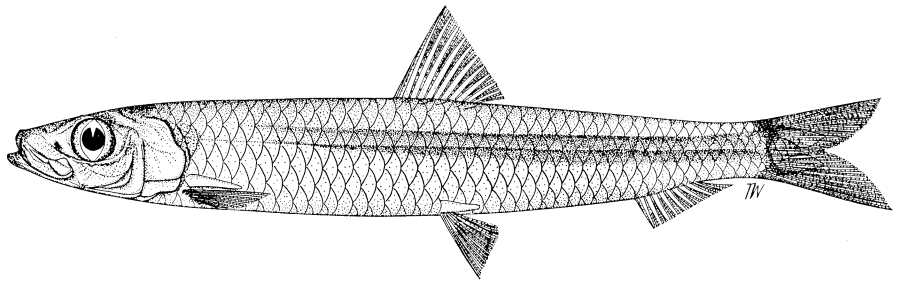

Fig. 3. *Spratelloides lewisi* sp. nov., holotype, 58.0 mm SL, Kolokofa, Santa Ysabel I., Solomon Is. (7°42′S, 58°34′E), BMNH 1979.8.16.503.

above, coll. L. Wongrat, BMNH 1979.8.17.15～21; 48 fish, 27.0～45.0 mm SL, as above, coll. L. Wongrat, CTNRC (uncatalogued); 9 fish, 24.0～34.0 mm SL, as above, coll. by a student, KUFM 2844b; 5 fish, 38.0～45.0 mm SL, Hualuang, Udontanee, Thailand, coll. unknown, NIFI (uncatalogued); 33 fish, 27.0～41.0 mm SL, Ubonrat reservoir, Konkhan, Thailand, coll. unknown, NIFI (uncatalogued); 55 fish, 16.0～46.0 mm SL, Lampao reservoir, Karasint, Thailand, coll. unknown, NIFI (uncatalogued); 84 fish, 23.0～37.0 mm SL, Ubonrat reservoir, Konkhan, Thailand, coll. T. Wongratana CUZM (uncatalogued).

Other specimens: 423 fish, 17.0～37.0 mm SL, Ubonrat reservoir, Konkhan, Thailand, coll. L. Wongrat and T. Chukachorn, BMNH 1979.8.16.80～502.

Diagnosis. Resembles *C. bleekeri* (Hardenberg, 1936) of the Kapuas River, Borneo, but the pectoral axillary scale is much shorter (22.7～52.6% of pectoral fin length; cf. 51～61%) and most meristic counts are lower, i.e. pectoral finrays 10～12, anal finrays (13) 14～16+2, predorsal scales 12～15, pseudobranchial filaments 10～13, ventral scutes (14) 15～17, but circumpeduncular scales 14 (cf. (11) 12, 16～18 +2, (15) 18, 12～16, (16) 17 (18) and 12 respectively in *C. bleekeri*).

From *C. goniognathus* Bleeker, 1855 of Lahat, Sumatra, and the Chao Phraya River, Thailand, it differs in its higher gillraker count (8～10+17～19; cf. 8+15～16) and anterior fading of the dusky line along the flank.

From *C. perakensis* of Perak River, Malaysia, it differs in having 8 pelvic finrays (as also in *C. bleekeri* and *C. goniognathus*).

Considerable variation in body depth was found (about 20～27% of SL in fish of 25～42 mm SL); this is not correlated with size, but may be related to maturation of the gonads.

Clupeichthys aesarnensis is recorded from northeastern Thailand, about 1000 km from the mouth of the Mekong River. Some 298.8 tons of this fish were landed at the Fishery Landing Site of the Ubonrat reservoir in 1978, being recorded as *Corica goniognathus* (Anon., 1980). Records of *C. goniognathus* from many places in Laos (Taki, 1974) may also refer to the present species.

3. ***Spratelloides lewisi*** sp. nov.
(Fig. 3)

Holotype. 58.0 mm SL, Kolokofa, Santa Ysabel. I., Solomon Is. (7°42′S, 58°34′E), coll. A.D. Lewis, BMNH 1979.8.16.503.

Paratypes. 11 fish, 31.0～44.0 mm SL, Port Moresby, Papua New Guinea, coll. A.D. Lewis, BMNH 1974.8.19.18～28; 23 fish, 42.0～60.0 mm SL, as holotype, BMNH 1978.8.15.128～150 (1 specimen alizarin stained).

Other specimens: 1 fish, 55.0 mm SL, as holotype, BMNH 1979.8.16.504; 29 fish, 20.0～25.0 mm SL, off Misol I., Irian Jaya, coll. B. Collette (BBC-1735), USNM (uncatalogued).

Diagnosis. Closely resembling the widespread silver-striped *S. gracilis* (Schlegel, 1846), but the stripe fading anteriorly and lower counts for anal finrays (usually 11～12; cf. 12～13), scales in lateral series (usually 40～43; cf. 42～45) and pyloric caeca (8～10; cf. 11～14). It also has a slightly more elongate body. In gillraker counts, however, it overlaps the range in *S. gracilis* (9～11+28～32; cf. 7～13+19～37 in *S. gracilis*).

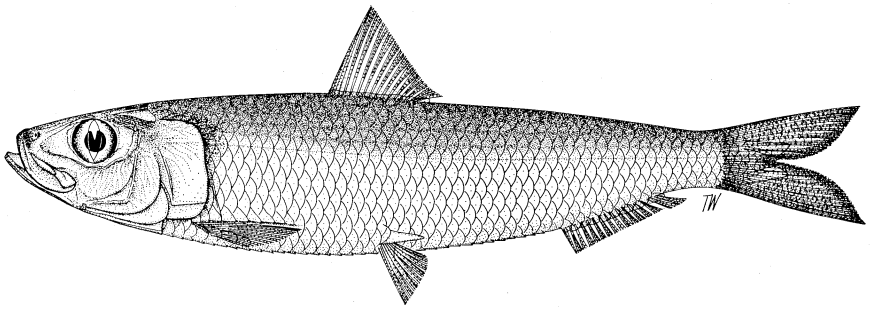

Fig. 4. *Sardinella* (*Sardinella*) *neglecta* sp. nov., holotype, 116.0 mm SL Formosa Bay, Kenya (2°59′S, 40°19′E), BMNH 1966.11.16.106.

Spratelloides lewisi is recorded from the Solomon Is. (Santa Ysabel I.) and from Port Moresby (southwestern coast of Papua New Guinea); it most likely occurs off northeastern coasts of Papua New Guinea and perhaps off the coast of northern Queensland. The specimens suggest that it does not reach the size of *S. gracilis* (to 95 mm SL).

Named for Mr. A. D. Lewis, who collected the specimens.

4. ***Sardinella* (*Sardinella*) *neglecta*** sp. nov.
(Fig. 4)

Holotype. 116.0 mm SL, Formosa Bay, Kenya (2°59′S, 40°19′E), coll. G. F. Losse, BMNH 1966.11.16.106.

Paratypes. 2 fish, 114.0～120.0 mm SL, Dar-es-Salaam, coll. G. F. Losse, BMNH 1966.11.16.80～81; 2 fish, 110.0～112.0 mm SL, Zanzibar Channel, coll. G. F. Losse, BMNH 1966.11.16.92～93; 11 fish, 106.0～132.0 mm SL, same data as holotype, BMNH 1966.11.16.94～105.

Other specimens: 1 fish, 112.0 mm SL, Mombasa, coll. R. J. Cuningham, BMNH 1913.4.7.2; 10 fish, 105.0～125.0 mm SL, Mombasa, coll. G. F. Losse, BMNH 1966.11.16.82～91; 1 fish 97.0 mm SL, Shimoni, Kenya, coll. G. F. Losse, BMNH 1966.11.17.1.

Diagnosis. Closely resembling *S. longiceps* Valenciennes, 1847 of Somalia to Indian coasts, but head shorter (27～29% SL; cf. 29～35%), range of gillrakers overlapping but fewer 108～166+142～188; cf. 117～241+150～253) and those on inner arches only slightly curled outwards; also, anterior double loop of intestine on either side of oesophagus only moderately or incompletely developed.

Resembling *S. lemuru* Bleeker, 1853 of the Indo-Australian Archipelago in head length and form of intestinal loops, but more gillrakers (only 51～153+77～188 in *S. lemuru*), and more pyloric caeca (160～205; cf. 133～151); also, fine circuli on exposed portion of scales (present in *S. longiceps,* but absent in *S. lemuru*).

Endemic to coasts of Kenya and Tanzania, thus clearly separated geographically from *S. longiceps* (northwestern Arabian Sea and coasts of India) and *S. lemuru* (coasts of China, Southeast Asia and Western Australia, where described as *Amblygaster posterus* Whitley, 1931).

5. ***Sardinella* (*Clupeonia*) *richardsoni***
nom. nov.
(Fig. 5)

Holotype. 113.0 mm SL, China, coll. J. Reeves, BMNH 1963.6.17.1. Type of *Clupea isingleena* Richardson, 1846.

Paratypes. 1 fish, 121.0 mm SL, Hainan I., Kwangtung, China, coll. S-Y. Lin, BMNH 1935.4.18.9; 10 fish, 102.0～116.0 mm SL, Pearl River mouth, Hong Kong, coll. W. L. Chan, BMNH 1965.7.5.1～10.

Diagnosis. Closely resembling *S. zunasi* of southern Japan and North China Sea in having the combination of perforated scales, vertical scale striae continuous or overlapping at centre, predorsal scales paired and overlapping in the midline, no dark spot at origin of dorsal fin, and few pyloric caeca (40～44; 38～43 in *S. zunasi*). It differs in having more gillrakers at any given length (36～42+63～74; cf. 21～31+42～58), a deeper body (32～36% SL; cf. 24～33%) and more perforations on the scales.

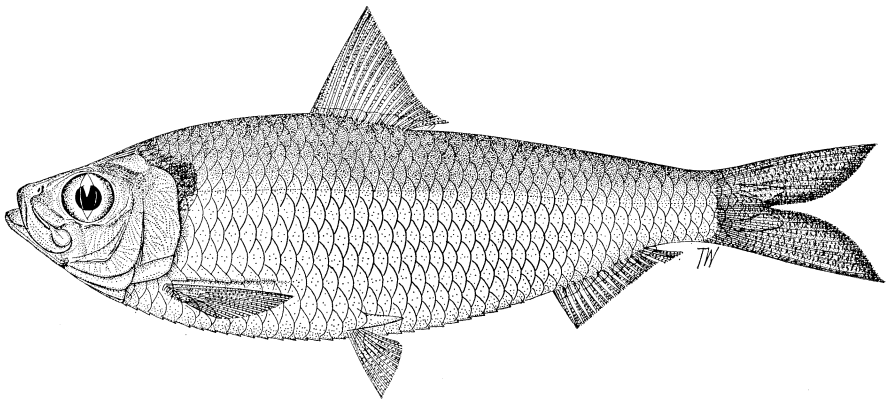

Fig. 5. *Sardinella* (*Clupeonia*) *richardsoni* nom. nov., a paratype, 105.0 mm SL, Pearl River mouth, Hong Kong, BMNH 1965.7.5.1～10.

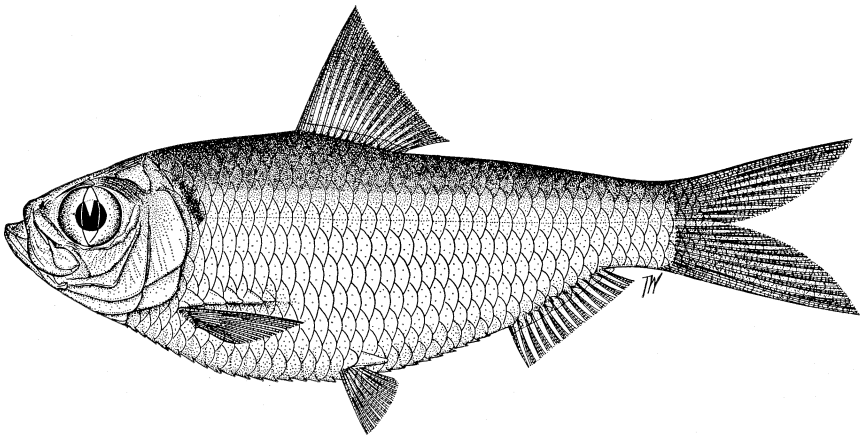

Fig. 6. *Herklotsichthys gotoi* sp. nov., holotype, 63.0 mm SL, Mimiko River, Papua New Guinea, BMNH 1913.12.9.179.

Richardson's name *isingleena* was rejected by the International Commission for Zoological Nomenclature (Opinion 901 in Bull. Zool. Nomencl., 26 (5～6): 217 of 1970). Chan (1965: 22) had earlier accepted in good faith that the type specimen of *isingleena* was in fact the type of Richardson's species *nymphaea* (as the label indicated). Whitehead (1966: 24) restored the type to *isingleena*, but considered it to be *Sardinella fimbriata* or *S. brachysoma* (Whitehead, 1973: 182), hence arguing that the name *isingleena* should be suppressed since unused for more than fifty years.

6. ***Herklotsichthys gotoi*** sp. nov.
(Fig. 6)

Holotype. 63.0 mm SL, Mimiko River, Papua New Guinea, coll. British Oxford University Expedition, BMNH 1913.12.9.179.

Paratype. 1 fish, 81.9 mm SL, Duyfken Point, near Weipa, Gulf of Carpenteria, Australia, coll. B. Collette (BBC 1679), USNM (uncatalogued).

Diagnosis. No prominent ridges of teeth on palatines or pterygoids. Closely related to *H. castelnaui* (Ogilby, 1897) of about the same region in having rather rounded (not elongate or wing-shaped) median predorsal scales (more or less hidden below the normal paired and overlapping scales). It differs in having a deeper body (38.7～41.0% SL; cf. 32～39%), and fewer gillrakers (16+34～36; cf. 18～22+39～52), and a very distinct black humeral spot, but no dark tips to dorsal and caudal fins.

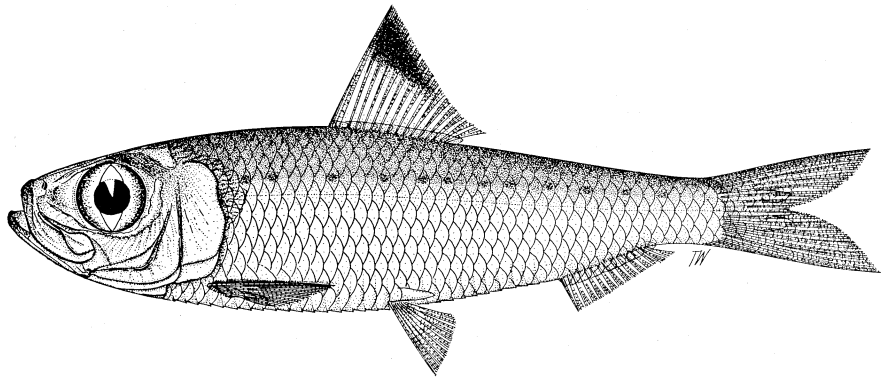

Fig. 7. *Herklotsichthys lossei* sp. nov., holotype, 69.0 mm SL, Arabian Gulf (30°08′N, 46°54′E), BMNH 1976.8.19.78.

Recorded from the western part of Irian Jaya and from the Gulf of Carpenteria. The holotype is the specimen recorded as *Clupea platygaster* by Regan (1914: 276), which was erroneously added to the synonymy of *Hilsa kelee* by Whitehead (1965: 130).

Named for Mr. H. E. Goto of Imperial College, University of London, director of my studies in London.

7. ***Herklotsichthys lossei*** sp. nov.
(Fig. 7)

Holotype. 69.0 mm SL, Arabian Gulf (30°08′N, 46°54′E), coll. G. F. Losse, BMNH 1976.8.19.78.

Paratypes. 13 fish, 63.0～69.0 mm SL, as above, BMNH 1976.8.19.51～63; 21 fish, 63.0～71.0 mm SL, as above, BMNH 1976.8.19.64～77; 1 fish, 78.0 mm SL, Bushire, Arabian Gulf, coll. H. Blegvad, UZMK C. 1; 3 fish, 65.0～66.0 mm SL, Bender Shahpur, Arabian Gulf, coll. H. Blegvad, UZMK C. 2～4.

Diagnosis. Prominent ridges of teeth on palatines and pterygoids; also, intestine more or less straight, without a loop below stomach and no expansion of anteroventral edge of 3rd infraorbital; predorsal scales normal, median, not hidden; small spots along flank and dorsal fin tip dark.

Resembles *H. spilurus* (Guichenot, 1863) of Réunion I. and Zanzibar, but more slender (body depth 26～28% SL; cf. 28～35%), more pyloric caeca (36～43; cf. 27～35) and with a series of dark spots along the flanks. Also resembles *H. punctatus* (Rüppell, 1837) of the Red Sea and Gulf of Suez, but has a dark blotch on upper part of dorsal fin and no small black spots along each side of back, also more pyloric caeca (cf. 29～34). Differs from the similar, wide-ranging and possibly sympatric (Gulf of Oman) *H. quadrimaculatus* (Rüppell, 1837) in lacking the wing-shaped predorsal scales hidden beneath the normal ones, having prominent ridges of teeth on palatines and pterygoids, no intestinal loop, less developed denticulations on hind edge of scales, etc.

Other characters are lower gillrakers usually 31～34, scutes (16) 17～18+(11)12～13=28～31 (usually 29～30) and scales in lateral series usually 38～40.

Herklotsichthys lossei is known from the Arabian Gulf, where it seems to replace the Red Sea *H. punctatus*. The Blegvad specimens (paratypes, see above) were identified as *H. punctatus* by Whitehead (1965: 244) and as *Sardinella melanura* by Blegvad and Løppenthin (1944: 66), followed by Fowler (1956: 67). The species may also occur in the Red Sea, judging from an Ehrenberg drawing of a Massawa fish (copy in the Valenciennes notes for the Histoire naturelle des poissons, 20; Bibliothèque Centrale Paris, M.S. 519, drawing XX.61).

Named for Mr. G. F. Losse, who collected most of the type material, and in recognition of his most useful studies of East African clupeoids (Losse, 1968).

8. ***Escualosa elongata*** sp. nov.
(Fig. 8)

Holotype. 64.5 mm SL, Sunday Market

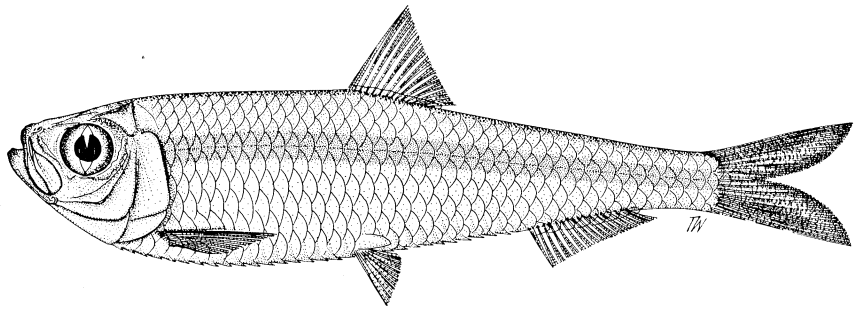

Fig. 8. *Escualosa elongata* sp. nov., holotype, 64.5 mm SL, Sunday Market (Sanarm-luang), Bangkok, Thailand, BMNH 1973.1.18.1.

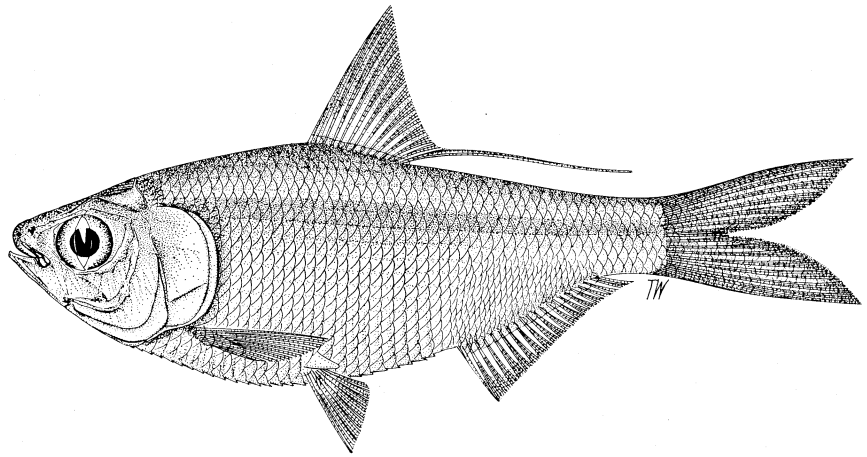

Fig. 9. *Nematalosa flyensis* sp. nov., holotype 76.0 mm SL, 450 km up river from Toro Pass, Fly River, New Guinea, BMNH 1979.8.17.1.

(Sanarm-luang), Bangkok, coll. P. J. P. Whitehead, BMNH 1973.1.18.1.

Paratype. 67.0 mm SL, Wholesale Fish Market, Bangkok, coll. T. Wongratana, CUMZ (uncatalogued).

Diagnosis. Distinguished from the widespread and hitherto monotypic *E. thoracata* (Valenciennes, 1847) by its more slender body (24.6～26.9% SL; cf. 27.3～37.0%) and caudal peduncle (8.3～10.5% SL; cf. 10.7～13.2%); pelvic fin base below 2nd～3rd dorsal fin-ray (cf. below or just before dorsal origin); width of silver lateral band on flanks 1/2 eye diameter (cf. about 1 eye diameter); distinct paired lines of dark dots along back, from occiput to caudal base.

Other characters are gillrakers 26～27+41 (cf. 16～25+27～40 in *E. thoracata*) and scutes 18+11～12 (cf. 17～19+10～12=28～30 in *E. thoracata*).

The specimens are not juveniles, nor are they physically malformed or damaged (in spite of their discovery in the markets). Having studied 172 specimens (28.0～95.0 mm SL) of *E. thoracata,* from at least fifteen localities between Pakistan and Queensland, I consider the small differences shown by *E. elongata* to be significant. The paratype was found amongst marine fishes from the east coast of the Gulf of Thailand, suggesting that the species is marine and not freshwater.

9. *Nematalosa flyensis* sp. nov.
(Fig. 9)

Holotype. 76.0 mm SL, 450 km up river from Toro Pass, Fly River, New Guinea, coll.

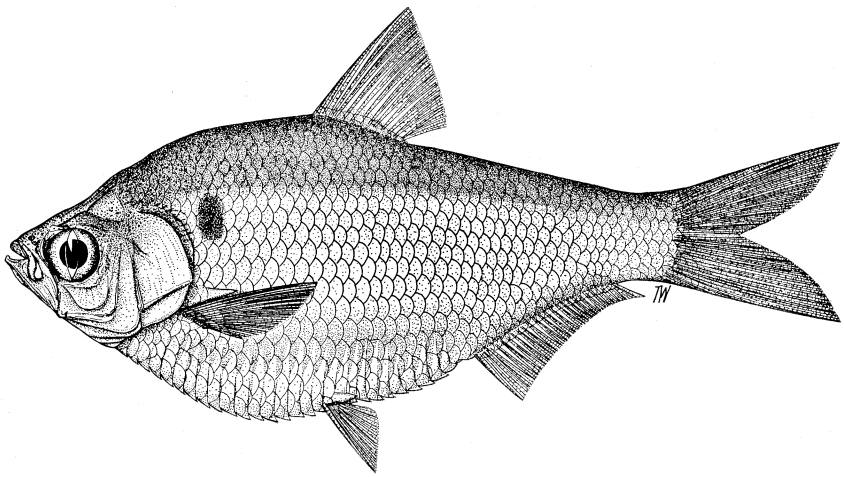

Fig. 10. *Gonialosa whiteheadi* sp. nov., holotype, 68.5 mm SL, Kokariet, Tenasserim, Burma, BMNH 1893.2.16.75.

T. Roberts, BMNH 1979.8.17.1.

Paratypes. 1 fish, 70.0 mm SL, Strickland River, New Guinea, AMS B. 9954 (a paratype of *Fluvialosa papuensis,* the remainder true *Nematalosa papuensis*); 4 fish, 51.0～75.0 mm SL, as for holotype, BMNH 1977.11.17.22～25; 12 fish, 152.0～222.0 mm SL, Fly River, New Guinea, coll. T. Roberts, USNM. 217022b; 3 fish, 34.0～51.0 mm SL, as above, USNM 217024b; 1 fish, 48.5 mm SL, as above USNM 217025b; 76 fish, 31.5～102.0 mm SL, as above, USNM 217026b.

Diagnosis. Posterior edge of scales distinctly toothed; 3rd infraorbital only moderately expanded ventrally, its anterior edge oblique; mouth subterminal, gape at level of lower border of eye or just above, pectoral axillary scale absent, scales above anal fin base smaller than elsewhere on body; no humeral spot. Very similar to the sympatric and syntopic *Nematalosa papuensis* (Munro, 1964), but at any given size has many more gillrakers (152～553+195～508; cf. 74～342+82～309), the longest on the ceratobranchial being 1.0～1.5 times in corresponding gill filament (cf. 1.5～2.4 times); also, head longer (usually 29～33% SL; cf. 25～31%).

Nematalosa flyensis was first noticed in the field by Dr. Tyson Roberts, who distinguished it from *N. papuensis* by the "longer and more up-turned lower jaw" (Roberts, 1978). Measurements do not confirm this, but *N. flyensis* certainly has a more slender upper jaw. The holotype of *N. papuensis* (AMS B. 9953, 95.0 mm SL) has 143+156 gillrakers.

Known only from the Fly and Strickland Rivers, New Guinea.

10. ***Gonialosa whiteheadi*** sp. nov.
(Fig. 10)

Holotype. 68.5 mm SL, Kokariet, Tenasserim, Burma, coll. L. Fea, BMNH 1893.2.16.75.

Diagnosis. Maxilla broadly expanded posteriorly, but straight, 8% SL; 2nd supramaxilla more than half length of maxilla, larger than the small premaxilla; hind margin of operculum and subopercular broadly semicircular; gillrakers 90+93. In the more slender Gangetic *G. manmina* (Hamilton-Buchanan, 1822) and the Burmese *G. modesta* (Day, 1869) the maxilla is broad anteriorly, but tapers posteriorly and curves down; 2nd supramaxilla less than half length of maxilla, but premaxilla greater than this; gillrakers 87～170+96～181. In addition, the hind margin of the operculum is fairly straight in *G. modesta*.

Known only from the type locality, Tenasserim, Burma.

Named for Dr. P. J. P. Whitehead, who encouraged me to make Indo-Pacific clupeoids the subject of my thesis.

11. ***Anodontostoma thailandiae*** sp. nov.
(Fig. 11)

Holotype. 99.0 mm SL, Songkhla, Gulf of

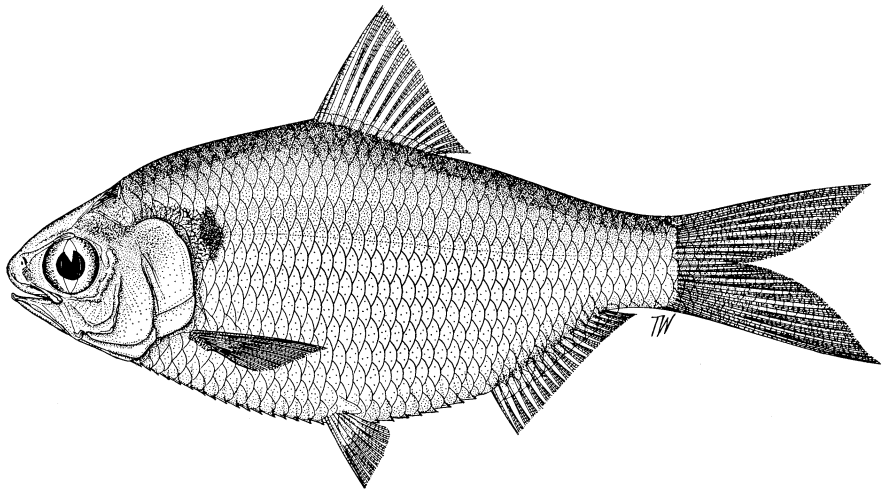

Fig. 11. *Anodontostoma thailandiae* sp. nov., holotype, 99.0 mm SL, Songkhla, Gulf of Thailand, CUMZ (uncatalogued).

Thailand, coll. S. Timkrab, CUMZ (uncatalogued).

Paratypes. 3 fish, 83.0~91.0 mm SL, India, ? coll. G. R. Waterhouse, BMNH 1858.8.15.97~98 (ex Zoological Society of London collection); 1 fish, 110.0 mm SL, Malatabas, Sarawak, coll. H. H. Rajah Brooke, BMNH 1894.1.19.76; 1 fish, 125.0 mm SL, Bangladesh, coll. M. A. Quddus, BMNH 1978.8.18.157; 3 fish 124.0~134.0 mm SL, Calcutta, coll. P. K. Talwar, BMNH 1979.8.16.37~39; 4 fish, 121.0~132.0 mm SL, as above, BMNH 1979.8.16.40~43; 1 fish, 110.0 mm SL, Phuket, Thailand, coll. T. Wongratana, CUMZ (uncatalogued).

Other specimens: 26 fish, 40.5~141.0 mm SL, Trad and Songkhla, Thailand, Calcutta, northern Sumatra, northeastern Borneo; BMNH, CUMZ, RMNH.

Diagnosis. Gillrakers 43~125+46~140, the longest ceratobranchial rakers about equal to corresponding gill filament or even longer than this; gill filaments at angle of gill arch much shorter than above or below, outer hemibranch usually less than half inner hemibranch at this point in fish over 95 mm SL; maxilla slender, anterior part not expanded ventrally, posterior part straight, the whole bone 7.9~10.3% SL; 2nd supramaxilla expanding posteriorly, not overlapped by tip of premaxilla; teeth on posterior edge of scales broader than incisions between them.

Clearly distinct from the widespread *A. chacunda* (Hamilton-Buchanan, 1822) and *A. selangkat* (Bleeker, 1852), in which the maxilla is expanded ventrally in front but curves downward at tip; the 2nd supramaxilla is needle-shaped and overlapped anteriorly by tip of premaxilla; the gill filaments at the angle of the gill arch are only slightly shorter than those above and below, while the outer hemibranch is always more than half inner hemibranch at this point.

Anodontostoma thailandiae has gone unrecognized in the past and has appeared in the literature as *A. chanpole* (e.g. Banasopit and Wongratana, 1967) or *A. chacunda* (e.g. Nelson and Rothman, 1973). It is likely that some previous records and notes on the biology of *A. chacunda,* especially in the Bay of Bengal, actually apply to *A. thailandiae.* The distribution is Gulf of Thailand, northeastern Borneo, northern Sumatra and Calcutta (where it seems to be quite common).

As far as I know, this is the first use of the name *thailandiae* in ichthyological literature, all previous patronyms being styled *siamensis,* etc.

12. ***Pellona dayi*** sp. nov.
(Fig. 12)

Holotype. 117.0 mm SL, Porto Novo, South India, coll. R. V. Seshaiya, BMNH 1969.11.6.17.

Paratypes. 5 fish, 77.0~96.0 mm SL,

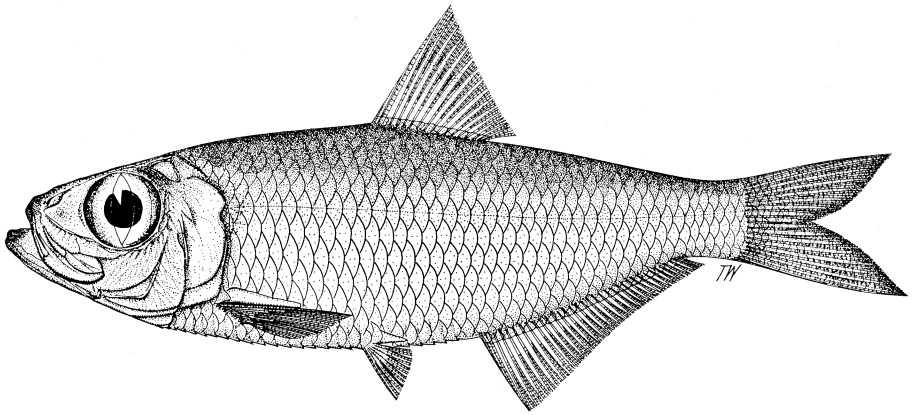

Fig. 12. *Pellona dayi* sp. nov., holotype, 117.0 mm SL, Porto Novo, South India, BMNH 1969.11.6.17.

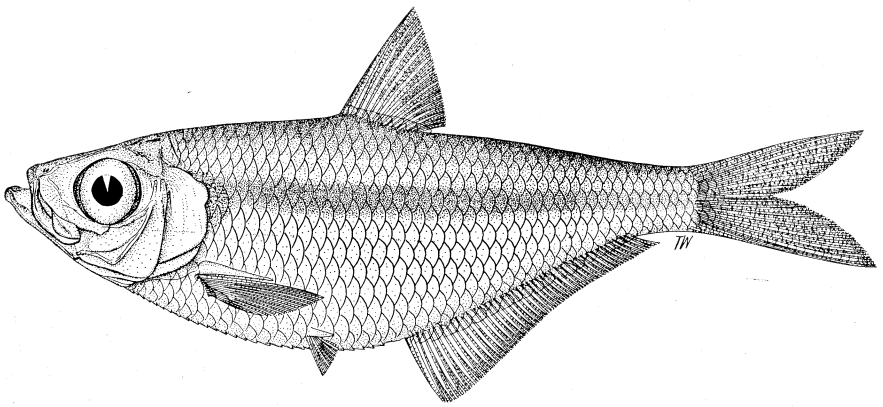

Fig. 13. *Ilisha striatula* sp. nov., a paratype, 114.0 mm SL, Tuticorin, South India, BMNH 1975.3.20. 700～709.

Madras, coll. F. Day, BMNH 1889.2.1.2002～2006; 2 fish, 121.0～135.0 mm SL, Porto Novo, South India, coll. R. V. Seshaiya, BMNH 1969.11.6.15～16.

Diagnosis. Distinguished from the widespread and hitherto monotypic. *P. ditchela* Valenciennes, 1847 by having the vertical striae on the scales discontinuous at the centre, leaving a wide gap (cf. overlapping); also, slightly fewer gillrakers (9～10+20～21; cf. 10～14+22～27 in 49 specimens counted). In specimens over 76 mm SL, *P. dayi* has been found to have the more slender body (body depth about 26～31.5% SL; cf. 32.5～36.5%).

Recorded so far only from the eastern coast of southern India, but almost certainly more widespread and undoubtedly misidentified as *P. ditchela* in the literature.

Named for Francis Day, who collected some of the paratypes and whose "Fishes of India" has been an inspiration to many like myself.

13. *Ilisha striatula* sp. nov.
(Fig. 13)

Holotype. 139.0 mm SL, Pakistan (25°11′N, 66°20′E), coll. F. Berry, BMNH 1968.8.26.2.

Paratypes. 1 fish, 120.0 mm SL, Karachi, coll. W. Townsend, BMNH 1898.6.29.184; 2 fish, 113.0～114.0 mm SL, Porto Novo, South India, coll. R. V. Seshaiya, BMNH 1969.11.6.5～6; 4 fish, 110.0～176.0 mm SL, Madras, coll. V. Ramaiyan, BMNH 1975.3.20.696～699; 10 fish, 114.0～140.0 mm SL, Tuticorin, South India, coll. V. Ramaiyan, BMNH 1975.3.20.700～709.

Other specimens: 36 fish, 62.0～168.0 mm

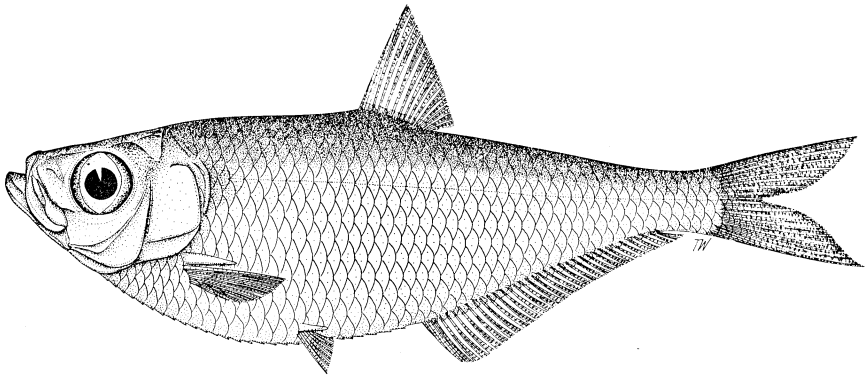

Fig. 14. *Ilisha obfuscata* sp. nov., holotype, 74.0 mm SL, Bombay, India, MNHN B. 2879 (the smaller fish of 2 syntypes of *Pellona filigera* Valenciennes, 1847).

SL, northeastern Arabian Sea, Porto Novo, Waltair, Madras and Vizhingam, southeastern India; all BMNH.

Diagnosis. Swimbladder with symmetrical paired post-coelomic prolongations on either side of anal pterygiophores; vertical striae on scales discontinuous, leaving a wide gap at centre. Resembling the sympatric *Ilisha kampeni* in these characters, but body deeper (depth 32～39% SL; cf. 24～32%), eyes larger (9.2～11.1% SL; cf. 7.9～9.3%), pectoral fins longer (18.0～20.4% SL; cf. 15.0～16.9%), fewer predorsal scales (13～15; cf. 15～18) and more but quite short pyloric caeca (about 38; cf. 15～19).

Specimens were first noticed mixed with specimens of *I. melastoma* (Schneider, 1801), being distinguished initially by a faint dark band along the flanks; in *I. melastoma,* however, the vertical striae are overlapping or continuous across the scale and there are more pyloric caeca (about 51).

Known from the northern part of Arabian Sea and eastern coasts of India, but perhaps more widespread and mistaken for *I. kampeni* or the widespread *I. melastoma* (Malabar coast to Java Sea and Taiwan).

14. *Ilisha obfuscata* sp. nov.
(Fig. 14)

Holotype. 74.0 mm SL, Bombay, coll. Dussumier, MNHN B. 2879 (smaller of 2 syntypes of *Pellona filigera* Valenciennes, 1847, the larger being designated lectotype by Whitehead, 1967: 117).

Paratype. 1 fish, 68.0 mm SL, Pondicherry, coll. Bélanger (paralectotype of *Pellona micropus* Valenciennes, 1847, the slightly larger of the two syntypes being designated lectotype by Whitehead, 1967: 115), MNHN 3712.

Diagnosis. Swimbladder with symmetrical paired post-coelomic prolongations on either side of anal pterygiophores; vertical striae on scales overlapping at centre. Resembling *I. melastoma* more or less in these features, but with more gillrakers (12～13+27～28; cf. usually 10～12+22～25) and the swimbladder prolongations apparently shorter (to above anal finrays 8～9 in the types; cf. to above finrays 15～23 in fish of 60～80 mm SL, or further in larger specimens), and no dark band along the flanks.

Known from the eastern and western coasts of India, but surely misidentified in the past as *I. melastoma* and thus more abundant than the present material suggests.

Engraulidae

15. *Stolephorus oligobranchus* sp. nov.
(Fig. 15)

Holotype. 57.0 mm SL, Rosario, Cavite, Manila Bay, Philippines, coll. I. A. Ronquillo, BMNH 1979.12.5.3.

Paratypes. 2 fish, 53.1～62.0 mm SL, as above, BMNH 1979.12.5.4～5.

Diagnosis. Maxilla short and blunt at tip, reaching only to anterior border of preoper-

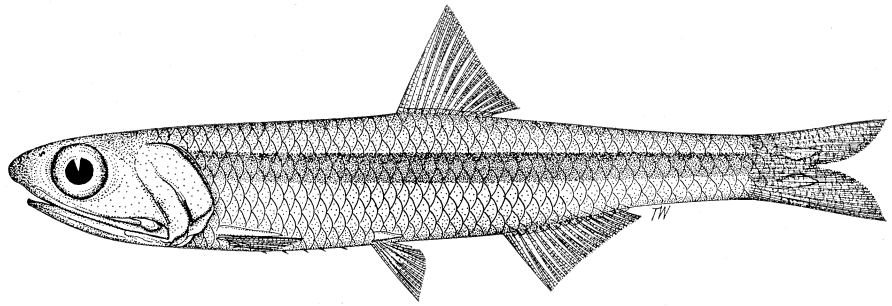

Fig. 15. *Stolephorus oligobranchus* sp. nov., holotype, 57.0 mm SL, Rosario, Cavite, Manila Bay, Philippines, BMNH 1979.12.5.3.

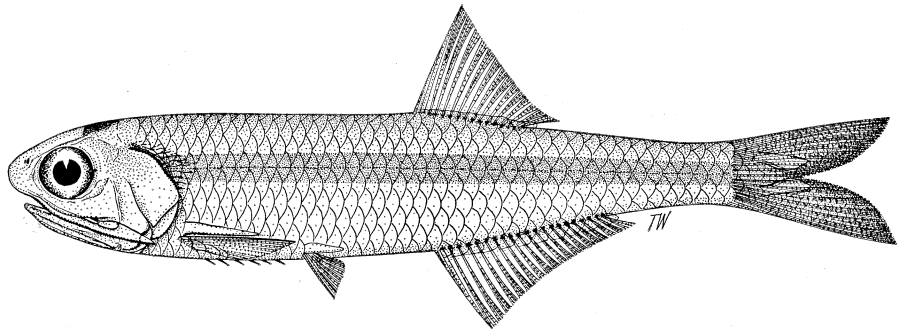

Fig. 16. *Stolephorus tysoni* sp. nov., holotype, 46.8 mm SL, east side of Daru Wharf, Gulf of Papua, BMNH 1979.3.21.453.

culum, the part posterior to the 2nd supramaxilla distinctly deeper than long; isthmus not wholly covering urohyal, the latter exposed in front and expanded as a small bony plate; 2 branchiostegal rays attached to posterior ceratohyal; gillrakers 13～14+17～18; prepelvic scutes 5; unbranched dorsal and anal finrays iii; snout and tip of lower jaw with dense speckling of dark dots.

Most closely resembles the widespread *S. devisi* Whitley, 1940, but without enlarged teeth on maxilla, pelvics reaching to below 7th dorsal ray (cf. to 2nd～5th dorsal ray) and fewer gillrakers (cf. 19～21+21～26); in fact, no other species of *Stolephorus* has so few gillrakers (14～27+18～35 in all others).

This is *Stolephorus* Species B of Ronquillo (1970). Apparently it is extremely rare and "was obtained only in Manila Bay after 20 months (341st sample)" according to Tiews et al. (1971). Ronquillo (1970) added Taiwan to its range, possibly based on *S. zollingeri* of Fowler (1941), but for the moment it seems safer to give its occurrence as Philippines only; *S. zollingeri* of authors may refer to *Engraulis japonicus*.

16. ***Stolephorus tysoni*** sp. nov.
(Fig. 16)

Holotype. 46.8 mm SL, east side of Daru Wharf, Gulf of Papua, coll. T. Roberts, BMNH 1979.3.21.453.

Paratypes. 8 fish, 43.8～48.0 mm SL, west side of Daru Wharf, Gulf of Papua, coll. T. Roberts, BMNH 1979.3.21.454～501; 4 fish, 39.0～47.4 mm SL, same as holotype, BMNH 1979.3.21.502～505; 1 fish, 45.2 mm SL, as holotype, USNM (uncatalogued); 9 fish, 26.1～46.2 mm SL, west side of Daru Wharf, etc., USNM (uncatalogued).

Diagnosis. Maxilla pointed, reaching to posterior border of suboperculum; isthmus entirely covered by sternohyoideus muscle, urohyal not exposed; hind border of preoperculum with an indentation beneath maxilla; 3 branchiostegal rays attached to posterior cerato-

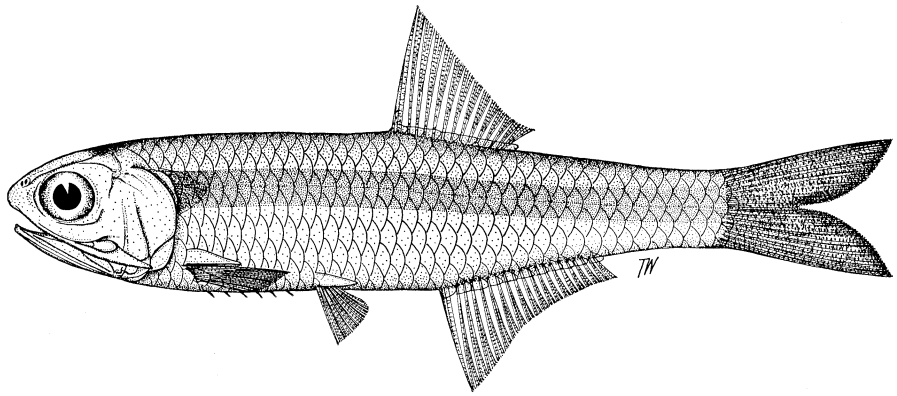

Fig. 17. *Stolephorus ronquilloi* sp. nov., holotype, 48.7 mm SL, Manila Bay, Philippines, BMNH 1969.5.30.88.

hyal; minute teeth present on dorsal hypohyal and upper edge of anterior ceratohyal; and 4~5 gillrakers on posterior face of 3rd epibranchial.

Resembles the partially sympatric *S. andhraensis* Babu Rao, 1966 of the Gulf of Papua, Singapore and east coast of India in most of these features, but the latter has only 2 branchiostegal rays attached to the posterior ceratohyal, no teeth on hyoid arch anal rays 19~23, usually 20~21 (cf. 21~24 in *S. tysoni*), gillrakers 14~15++20~21 (cf. 15~18+21~25), and 1st and 3rd infraorbitals with short posterior extensions (longer in *S. tysoni*).

Resembles the widespread *S. insularis* Hardenberg, 1933 in having 6~7 prepelvic scutes, teeth on the hyoid arch, but that species has 2 branchiostegal rays on the ceratohyal, the anal fin origin further back (usually below 8th~9th dorsal finrays; cf. usually below 4th~6th in *S. tysoni*) and also a double pigment line along back behind dorsal fin.

Known from the Gulf of Papua; specimens from Moreton Bay, west of Mudlark I., Australia (MNHN 1981–91) have been examined by Dr. P. J. P. Whitehead (in litt.).

Named for Dr. Tyson Roberts, who not only collected the types, but kindly made available many other of his New Guinea clupeoid specimens and generously shared his collection data. Because of the homonym *Stolephorus robertsi* Jordan et Rutter, 1897 (=*Cetengraulus edentulus* of the western Atlantic), I have latinized Dr. Roberts' first name.

17. ***Stolephorus ronquilloi*** sp. nov.
(Fig. 17)

Holotype. 48.7 mm SL, Manila Bay, Philippines, coll. I. A. Ronquillo, BMNH 1969.5.30.88.

Paratypes. 14 fish, 43.0~54.0 mm SL, Manila Bay, coll. L. Mañalac, BMNH 1960.4.7. 103~115; 8 fish, 33.0~47.5 mm SL, Cavite, Luzon, Philippines, coll. T. Abe, BMNH 1966.1. 17.126~133; 9 fish, 47.0~50.0 mm SL, Mindanao, Philippines, coll. I. A. Ronquillo, BMNH 1969.4.22.1620~1624; 21 fish, 45.0~48.5 mm SL, Manila Bay, coll. I. A. Ronquillo, BMNH 1969.5.30.79~87.

Other specimens: 59 fish, 35.0~53.0 mm SL, all Philippines; all BMNH.

Diagnosis. Maxilla pointed, reaching to posterior border of suboperculum; isthmus entirely covered by sternohyoideus muscle, urohyal not exposed; hind border of preoperculum with an indentation beneath maxilla; 2 branchiostegal rays on the ceratohyal; usually 5~7 prepelvic scutes; and a double pigment line along back behind dorsal fin.

Resembles the widespread *S. insularis* Hardenberg, 1933 in these features, but lacks teeth on upper edge of ceratohyal, has more gillrakers (usually 20~21+28~30; cf. 16~20+22~28), no predorsal spine, pelvic tips about half an eye diameter from vertical from dorsal fin origin (cf. about one quarter in *S. insularis*), posterior margin of 1st infraorbital falling well short of that of 3rd infraorbital (cf. in same vertical) and the isthmus spotted with a few or many dark dots.

Recorded only from the Philippines.

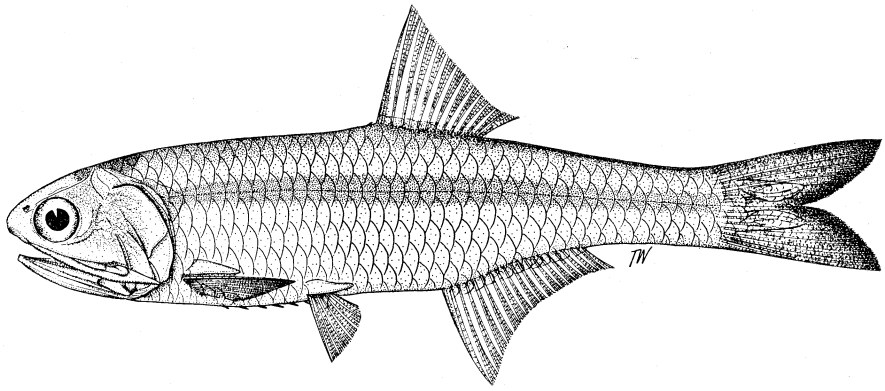

Fig. 18. *Stolephorus dubiosus* sp. nov., holotype, 69.0 mm SL, Songkhla Lake, Thailand, BMNH 1969.4.22.1826.

Named for Mr. I. A. Ronquillo, whose extensive collections of *Stolephorus* (including the holotype and most of the paratypes of *S. ronquilloi*) were donated to the British Museum (Natural History) and whose own studies of this genus broke the ground for me. This is *Stolephorus* Species C of Ronquillo (1970).

18. ***Stolephorus dubiosus*** sp. nov.
(Fig. 18)

Holotype. 69.0 mm SL, Songkhla Lake, Thailand, coll. I. A. Ronquillo, BMNH 1969.4.22.1826.

Paratypes. 2 fish, 50.0～59.0 mm SL, Paknam, Thailand, coll. R. M. De Schauensee, ANSP 61760～61761; 12 fish, 44.0～65.0 mm SL, Bangkok, Thailand, coll. R. M. De Schauensee, ANSP 60565～60577; 1 fish, 69.0 mm SL, Orissa, India, coll. F. Day, BMNH 1889.2.1.1840; 5 fish, 42.0～52.5 mm SL, Chilka Lake, Orissa, India, coll. M. Babu Rao, BMNH 1969.4.22. 1805～1809; 3 fish, 60.0～70.0 mm SL, Songkhla Lake, Thailand, coll. I. A. Ronquillo, BMNH 1969.4.22.1823～1825; 6 fish, 58.0～66.0 mm SL, Samutsakorn, Thailand, coll. T. Tweesit, BMNH 1977.11.30. 71～76.

Other specimens: 77 fish, 42.0～75.0 mm SL, east coast of India, including Godavari estuary; Songkhla Lake, Nakornsrithammaraj and Surajthani, Gulf of Thailand; Aluhaluh on Barito River, Kalimantan; all BMNH.

Diagnosis. Maxilla pointed, reaching to posterior border of suboperculum; isthmus entirely covered by sternohyoideus muscle, urohyal not exposed; gillrakers 19～24+25～31, with about 5～7 short gillrakers on posterior face of 3rd epibranchial; pyloric caeca 7～12; spine present at dorsal origin and on pelvic scute; scale striae reticulated; a double pigment line along back behind dorsal fin.

Resembles both the sympatric *S. baganensis* Hardenberg, 1931 and *S. tri* (Bleeker, 1852) in having a predorsal spine and also a spine on the pelvic scute, reticulated scale striae, 2 branchiostegal rays on ceratohyal, which has minute teeth on upper edge, and the hind end of the 1st infraorbital produced and about opposite that of the 3rd infraorbital. However, both species have fewer grillrakers (16～19+20～24 and 15～17+19～22, respectively), but more pyloric caeca (11～13 in *S. baganensis* and 15～16 in *S. tri*).

Hardenberg (1933) gave counts of 19～20 lower gillrakers for his *S. baganensis macrops* and 22～23 for his *S. baganensis baganensis,* but 20～29 for the species as a whole. Dutt and Babu Rao (1959) supplied the higher counts (22～28, mean 26) for their *S. baganensis,* but added a third subspecies, *S. baganensis bengalensis* with a low count (mean 23). Having examined more than fifty specimens of *S. baganensis,* I restrict it to fish with only 20～24 lower gillrakers (cf. 25～31 in *S. dubiosus*) and 11～13 pyloric caeca (cf. 7～12).

Known from the Bay of Bengal, southern Kalimantan (Barito River) and Gulf of Thailand, in brackish water or estuaries.

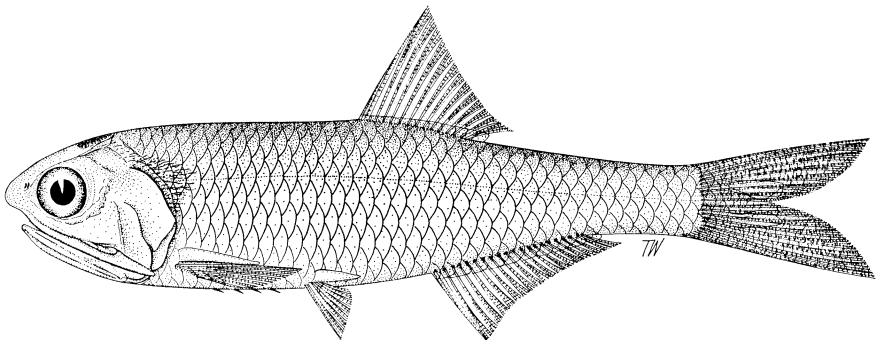

Fig. 19. *Stolephorus brachycephalus* sp. nov., holotype, 42.0 mm SL, east side of Daru Wharf, Gulf of Pupua, BMNH 1979.3.21.447.

19. ***Stolephorus brachycephalus*** sp. nov.
(Fig. 19)

Holotype. 42.0 mm SL, east side of Daru Wharf, Gulf of Papua, coll. T. Roberts, BMNH 1979.3.21.447.

Paratypes. 5 fish, 27.0～37.0 mm SL, as above, BMNH. 1979.3.21.448～452; 8 fish, 27.2～29.4 mm SL, as above, USNM (uncatalogued).

Other specimens: 1 fish, 37.0 mm SL, as above, BMNH. 1979.8.16.828.

Diagnosis. Maxilla pointed; reaching beyond posterior border of suboperculum; isthmus entirely covered by sternohyoideus muscle, urohyal not exposed; small patch of teeth on palatines and pterygoids, 3 branchiostegal rays on ceratohyal, hind border of preoperculum evenly rounded, without an indentation beneath maxilla; anterior part of swimbladder a thread-like tube; pelvic fin tip reaching level of 1st～3rd dorsal finrays.

Resembling the widespread *S. commersonii* Lacepède, 1803 in these features, but branchiostegal rays 10～11 (cf. 12～13 in *S. commersonii*), minute teeth absent from dorsal hypohyal and upper edge of anterior ceratohayl, 1st and 3rd infraorbitals with longer posterior extensions, pectoral finrays usually 12～13 (cf. 13～15), anal finrays usually 23～24 (cf. 21～23), prepelvic scutes 4～5 (cf. 0～5, but usually 2～3) and no dusky band on midline of back before dorsal fin.

Having examined more than two hundred specimens of *S. commersonii*, of all sizes and ranging from East Africa across to Fiji and the Caroline Islands, I believe that the differences found here are significant in spite of the small size of the specimens.

Known only from Gulf of Papua.

20. ***Thryssa (Scutengraulis) kammalensoides*** sp. nov.
(Fig. 20)

Holotype. 112.0 mm SL, Godavari estuary, eastern coast of India, coll. S. Dutt, BMNH 1965.7.12.248.

Paratype. 1 fish, 108.0 mm SL, as above, BMNH 1965.7.12.247.

Diagnosis. Maxilla just reaching to posterior border of suboperculum, 1st supramaxilla absent; mouth inferior, symphysis of lower jaw scarcely above lower border of eye when mouth closed, the tip of the snout level with or just above eye centre; jaw teeth small; gillrakers 18+24～25, their serrae not clumped; pelvic tips falling short of vertical from dorsal fin origin by 1/2～3/4 eye diameter; anal finrays 34～35; 36～37 lateral scales, scale striae vertically continouus at centre; a dark saddle-like blotch on nape.

Resembles *Thryssa* (*Scutengraulis*) *aestuaria* (Ogilby, 1911) of Queensland and Gulf of Papua, *T.* (*S.*) *kammalensis* (Bleeker, 1849) of Southeast Asia and the widespread *T.* (*S.*) *dussumieri* (Valenciennes, 1848) in the dark nuchal blotch, but these have either more gillrakers (22～25+27～29; 22～27+26～32, respectively) or fewer (usually 13～16+17～19 in *T.* (*S.*) *dussumieri*; cf. 18+24～25 in *T.* (*S.*) *kammalensoides*); it should be noted that the blotch in *T.* (*S.*) *dussumieri* is more in the nature of an oblique humeral spot. The first two species have a

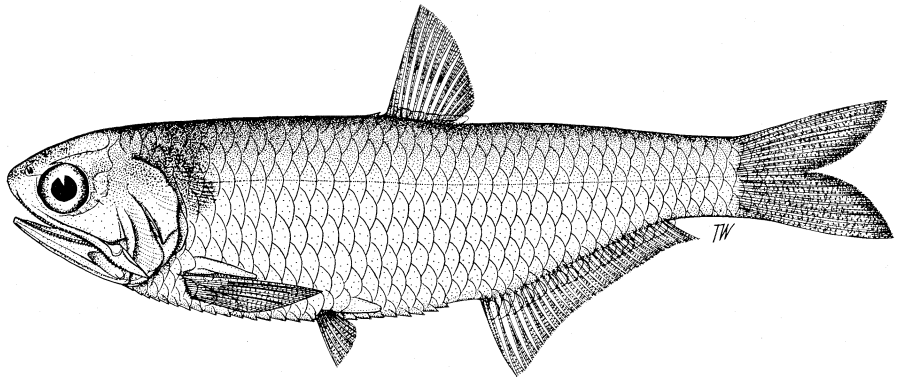

Fig. 20. *Thryssa* (*Scutengraulis*) *kammalensoides* sp. nov., holotype, 112.0 mm SL, Godavari esturay, eastern coast of India, BMNH 1965.7.12.248.

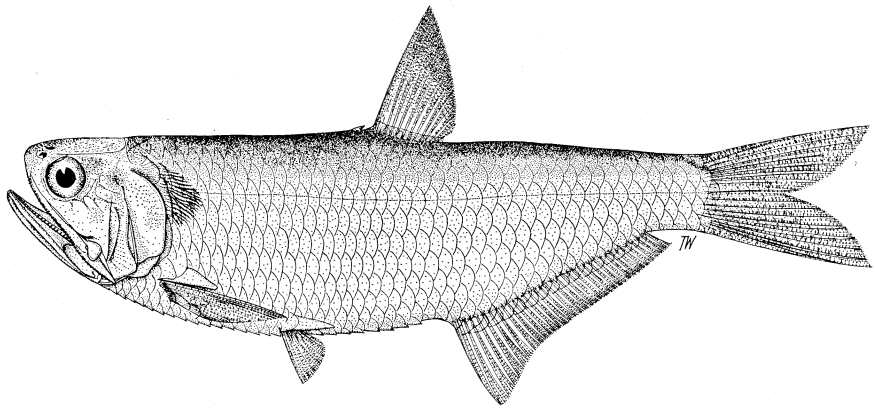

Fig. 21. *Thryssa* (*Scutengraulis*) *polybranchialis* sp. nov., a paratype, 121.0 mm SL, India, BMNH 1967.3.4.57.

relatively large 1st supramaxilla, however (at least half length of 2nd supramaxilla).

From *T.* (*S.*) *polybranchialis* sp. nov. (see below), which has a gillraker count of 18～21＋25～27, it differs in a lower anal finray count (34～35; cf. 38～42), fewer lateral scale rows (36～37; cf. 41～44), pattern of scale striae (just interrupted at centre of scale in *T.* (*S.*) *polybranchialis*) and shape of snout, mouth and head (see description below).

Known only from the Godavari estuary, eastern coast of India.

21. *Thryssa* (*Scutengraulis*) *polybranchialis* sp. nov.
(Fig. 21)

Holotype. 170.0 mm SL, Bombay, coll. F. Day, BMNH 1889.2.1.1757.

Paratypes. 1 fish, 113.0 mm SL, as above, BMNH 1889.2.1.1758; 2 fish, 136.0～140.0 mm SL, Canara, India, coll. F. Day, BMNH 1889.2.1.1760; 1 fish, 121.0 mm SL, India, coll. M. Babu Rao BMNH 1967.3.4.57; 1 fish, 149.0 mm SL, Porto Novo, South India, coll. A. Sivakumar, BMNH 1979.8.15.25.

Other specimens: 4 fish, 47.0～78.0 mm SL, Porto Novo and Waltair, eastern coast of India, and Cochin, western coast of India; all BMNH.

Diagnosis. Maxilla 21.1～23.1% SL, its tip reaching to or scarcely behind posterior border of interoperculum, 1st supramaxilla very small or absent; mouth oblique and subterminal, symphysis of lower jaw slightly produced beyond tip of snout and more or less above lower border of eye when mouth closed, snout tip well

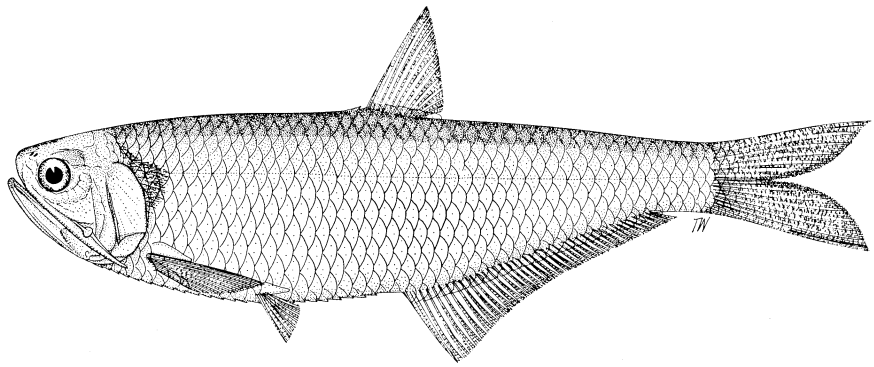

Fig. 22. *Thryssa* (*Scutengraulis*) *whiteheadi* sp. nov., holotype, 111.5 mm SL, Basra, Arabian Gulf, BMNH 1920.3.3.192.

above eye centre; a distinct hump at nape; jaw teeth small; gillrakers 18～21+25～27, their serrae not clumped; pelvic tips falling short of vertical from dorsal fin origin by about 3/4 eye diameter; anal finrays 38～42; scale striae with a slight gap at centre; no saddle-like blotch on nape.

Resembles *T.* (*S.*) *kammalensoides* in gillraker count (18+24～25 in the latter species), but more anal finrays (cf. 34～35), more lateral scale rows (see above), and mouth, snout and head shape different; also, no nuchal blotch. Its high gillraker count clearly separates it from the superficially similar *T.* (*S.*) *malabarica* (Bloch, 1795) and *T.* (*S.*) *hamiltonii* Gray, 1835 (14～16+17～19 and 7～10+11～15, respectively), while *T.* (*S.*) *kammalensis* (Bleeker, 1849) has a somewhat similar count (22～27+26～32), but the pelvic tips in that species reach to beyond a vertical from the dorsal fin origin, the 1st supramaxilla is relatively large and there is a nuchal blotch.

Recorded from the eastern and western coasts of India.

22. *Thryssa* (*Scutengraulis*) *whiteheadi* sp. nov.
(Fig. 22)

Holotype. 111.5 mm SL, Basra, Arabian Gulf, coll. C. Christy, BMNH 1920.3.3.192.

Paratypes. 19 fish, 59.0～143.0 mm SL, as above, BMNH 1920.3.3.183～191; 2 fish, 99.0～160.0 mm SL, Bushire, Persiske, Haubugt, Arabian Gulf, coll. H. Blegvad. UZMK CN. 3～4.

Diagnosis. Maxilla fairly short (19.2～21.3% SL), only slightly projecting beyond gill cover, 1st supramaxilla absent; mouth oblique and subterminal, symphysis of lower jaw slightly produced beyond tip of snout and more or less above lower border of eye when mouth closed, snout tip well above eye centre; jaw teeth distinctly enlarged; gillrakers usually 13～15+18～20, their serrae not clumped; branchiostegal rays 11～12; pelvic fin tips ending well before vertical from dorsal fin origin; anal finrays 42～46; vertical scale striae interrupted but overlapping at centre of scale; humeral spot indistinct and no prominent dark markings along midline of back.

Resembles *T.* (*S.*) *spinidens* (Jordan et Seale, 1925) of the Bay of Bengal and *T.* (*S.*) *dayi* sp. nov. of west coast of India and Pakistan (see below) in its enlarged teeth, but has a higher gillraker count (cf. 9～11+13～15 and 11～13+14～18, respectively, against 12～15+18～21 in *T.* (*S.*) *whiteheadi*), also no 1st supramaxilla. The widespread *Thryssa* (*S.*) *vitrirostris* (Gilchrist et Thompson, 1908), which also occurs in the Arabian Gulf, has a minute 1st supramaxilla and differs also in having the gillraker serrae distinctly clumped in larger fishes, the maxilla reaching or almost reaching the pectoral fin base and usually more gillrakers (14～17+20～23 in most specimens) and fewer anal finrays (usually 35～41).

Known so far only from the Arabian Gulf.

Named for Dr. P. J. P. Whitehead, whose review of the clupeoids of the Red Sea and adjacent regions (Whitehead, 1965) was a major step in understanding the species of this region.

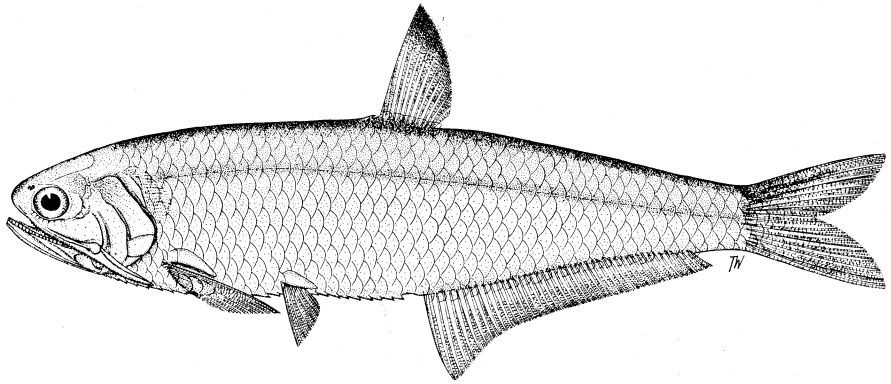

Fig. 23. *Thryssa* (*Scutengraulis*) *stenosoma* sp. nov., holotype, 128.0 mm SL, Godavari estuary, eastern coast of India, BMNH 1965.7.12.231.

23. ***Thryssa* (*Scutengraulis*) *stenosoma***
sp. nov.
(Fig. 23)

Holotype. 128.0 mm SL, Godavari estuary, eastern coast of India, coll. S. Dutt, BMNH 1965.7.12.231.

Paratypes. 5 fish, 121.0～148.0 mm SL, as above, BMNH 1965.7.12.226～230; 1 fish, 148.0 mm SL, India, coll. M. Babu Rao, BMNH 1967.3.4.56; 2 fish, 71.0～74.0 mm SL, Bangladesh, coll. M. A. Quddus, BMNH 1978.8.18.162～163.

Diagnosis. Maxilla long (20.4～24.5% SL), reaching to just behind pectoral fin base, or nearly so in small fishes, 1st supramaxilla minute; symphysis of lower jaw slightly produced beyond tip of snout, the latter above level of eye centre; gillrakers usually 13～15+17～19, their serrae not clumped; branchiostegal rays 12～15; anal finrays 43～48; vertical striae on scales interrupted at centre; no humeral spot, but a pair of pigmented lines on back from head to caudal.

Resembles the sympatric *T.* (*S.*) *purava* (Hamilton-Buchanan, 1822), but is more slender (depth 23.4～26.3% SL; cf. 24.6～29.5%), has a shorter head (19.5～21.0% SL; cf. 21.2～24.7%), and a longer maxilla (cf. reaching to only 1/3～1/2 distance between gill cover and pectoral fin base in *T.* (*S.*) *purava*). Belonging to this group is *T.* (*S.*) *dayi* sp. nov. (see below), which has a longer maxilla (23～27% SL), reaching to or beyond pectoral fin base, fewer gillrakers (10～13+14～18) and sometimes a short pectoral filament.

Recorded from the Godavari and Ganges estuaries. Specimens have surely been misidentified as *T.* (*S.*) *purava* in the past.

24. ***Thryssa* (*Scutengraulis*) *dayi*** sp. nov.
(Fig. 24)

Holotype. 208.0 mm SL, Bombay, coll. F. Day, BMNH 1889.2.1.1803.

Paratypes. 1 fish, 145.0 mm SL, near Karachi, Pakistan, coll. unknown, BMNH 1860.3.19.820; 1 fish, 215.0 mm SL, Sind, Pakistan, coll. F. Day, BMNH 1889.2.1.1802; 2 fish, 128.0～145.0 mm SL, Bombay, coll. S. Dutt, BMNH 1965.7.12.249～250; 5 fish, 138.0～152.0 mm SL, Ernakulam, South India, coll. S. Dutt, BMNH 1965.7.12. 251～255.

Other specimens: 1 fish, 66.0 mm SL, Bombay, coll. F. Day, BMNH 1889.2.1.1794; 1 fish, 80.5 mm SL, Bombay, coll. I. A. Ronquillo, BMNH 1969.8.19.9.

Diagnosis. Maxilla long (23.0～27.0% SL), reaching to pectoral fin base, 1st supramaxilla minute; symphysis of lower jaw slightly produced beyond tip of snout, the latter above level of eye centre; jaw teeth enlarged, especially in lower jaw; gillrakers 10～13+14～18, their serrae enlarged, but not clumped; branchiostegal rays 12～14; pectoral fins reaching to pelvic fin base, upper ray sometimes a short filament; anal finrays 44～49; vertical scale striae interrupted at centre; humeral spot indistinct, a pair of dark lines down back, from occiput to caudal fin base.

Distinguished from all other species of *Thryssa* by the presence of a pectoral filament, at least

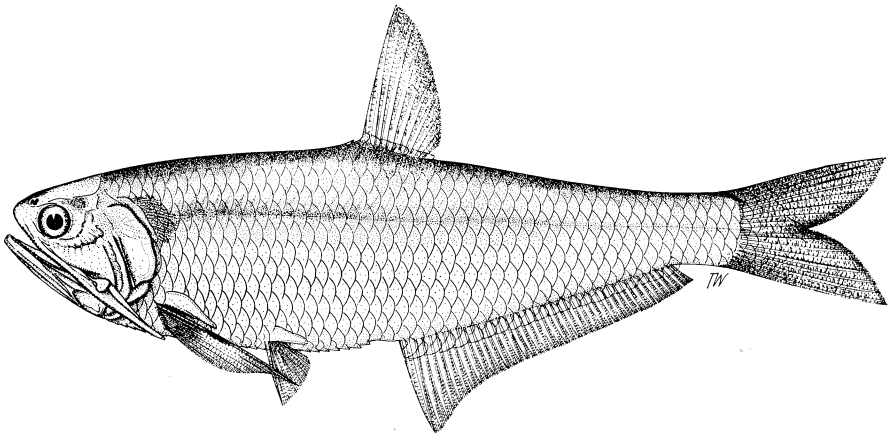

Fig. 24. *Thryssa* (*Scutengraulis*) *dayi* sp. nov., a paratype, 128.0 mm SL, Bombay, India, BMNH 1965.7. 12.249～250.

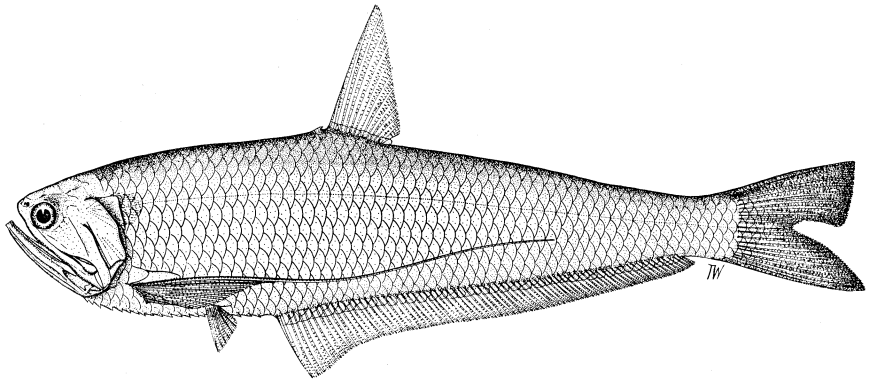

Fig. 25. *Setipinna wheeleri* sp. nov., a paratype, 185.0 mm SL, Rangoon, Burma, BMNH 1889.2.1.1788～1789.

in some specimens. Closely resembles *T.* (*S.*) *purava* (Hamilton-Buchanan, 1822) and replaces it in the Arabian Sea, but the latter has a shorter maxilla (reaching to only 1/3～1/2 distance between gill cover and pectoral fin base) and more gillrakers (14～16+18～19; cf. 10～13+14～18) with smaller serrae. The distinction from *T.* (*S.*) *stenosoma* is given under that species.

Known from Karachi southward to Ernakulam on the southwest coast of India.

Named for Francis Day, the greatest of all ichthyologists to study Indian fishes, among whose collection were two of the types described here, as well as a young specimen.

25. ***Setipinna wheeleri*** sp. nov.
(Fig. 25)

Holotype. 116.5 mm SL, Sittang River, Burma, coll. E. W. Oates, BMNH 1891.11.30.390.

Paratypes. 2 fish, 119.5～185.0 mm SL, Rangoon, Burma, coll. F. Day, BMNH 1889.2.1. 1788～1789.

Diagnosis. Maxilla tip pointed, 2nd supramaxilla narrow and tapering anteriorly; gillrakers 16～18+21～22, upper edges wavy, the serrae distinctly clumped, even in small fish; pectoral filament very long, reaching to base of 45th～51st anal finrays, 2nd pectoral finray reaching to anal fin origin; anal finrays 69 and 73～74; upper lobe of caudal fin truncate; scales with very few anterior striae.

Resembles both *S. phasa* (Hamilton-Buchanan, 1822) of Calcutta, Orissa and Chacar of Bay of Bengal and *S. brevifilis* (Valenciennes, 1848) of Calcutta, Allahabad and Delhi, but has more gillrakers (16～18+21～22; cf. usually 15～16

+18～19 and 14～15+17, respectively), a longer pectoral filament (at most to anal finrays 39 or 15 in *S. phasa* and *S. brevifilis*) and rather few anterior striae on the scales. Although these differences are fairly small, separation of this riverine form at species level reflects recognition of other Burmese riverine endemics, e.g. *Gudusia variegata, Gonialosa whiteheadi* sp. nov. and *Gonialosa modesta*.

Recorded from the Sittang River and Rangoon, Burma. Previous records of *S. phasa* (or its synonym *S. telara*) and *S. brevifilis* from Burmese freshwaters most likely refer to *S. wheeleri*.

Named for Mr. A. C. Wheeler of the Fish Section (Marine), British Museum (Natural History), whose kind help during my time there was much appreciated.

Acknowledgements

The results presented here derive from nearly four and a half years spent in the Fish Section (Marine) of the British Museum (Natural History) and I express my sincere thanks for the freest use of the collections, libraries and other facilities; in particular, I am indebted to Dr. P. J. P. Whitehead and Mr. A. C. Wheeler for their kindness and help. Dr. Whitehead served as Supervisor of my Ph. D. studies and generously gave me the benefit of his extensive knowledge of clupeoid fishes and their literature, while Mr. H. E. Goto of the Division of Life Sciences at Imperial College of Science and Technology, University of London, offered advice, encouragement and interest. My stay in London was supported by scholarships from the British Council and the Royal Anandamahidol Foundation, for which I am indebted to His Majesty King Bhumibol Adulyadej of Thailand for graciously bestowing his patronage; the Foundation gave further support for this work and the dissemination of the results, and this too is gratefully acknowledged. Finally, I must thank all those who sent me material or, in the case of Leiden and Paris, allowed me to work on specimens in their institutions.

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インド-太平洋産ニシン亜目 24 新種と 1 新学名

Thosaporn Wongratana

インド-太平洋海域のニシン亜目魚類 24 新種（ニシン科 13 種，カタクチイワシ科 11 種）と 1 新学名種（ニシン科）を記載するとともに，これまで同種異名（ジュニアーシノニム）とされたり，見過ごされてきた 38 種（ニシン科 20 種，カタクチイワシ科 18 種）をあらためて有効と認めた．

本研究は大英博物館において調査した 15,000 個体，諸研究機関より借用した 1,000 個体におよぶ標本にもとづき，1980 年にロンドン大学へ提出した学位論文“インド-太平洋産ニシン亜目魚類に関する再検討”の一部である．本研究においてはニシン亜目のほとんど全ての既設の種名に関し，調査可能な模式標本のうち少なくとも 1 個体の検査を行った．